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Exhibit A
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STANDARDS FOR STATISTICAL SURVEYS

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Introduction

This document presents standards for the planning and conduct of statistical surveys. The recommendations embodied in these standards have been developed by the Bureau of the Budget in consultation with the statistical agencies of the Federal Government. They are intended as guides to good statistical practice for use in surveys conducted directly by Federal agencies and in those conducted, under Federal sponsorship, by universities, market research firms, trade associations or other contracting organizations.

These standards apply primarily to statistical surveys. As used here, a "statistical survey" is one in which the primary purpose of the individual returns is to supply data which can be aggregated to provide statistical or numerical information needed on a particular class, segment, activity or area, and in which no administrative action is taken on the basis of the individual return itself. Among the data collections for which these standards have only limited relevance are forms used in applying a Federal law or regulation to an individual or firm (such as tax returns or the financial and operating reports required by regulatory commissions) and applications or registrations (such as forms used in applying for materials, grants, loans, licenses or other privileges). Also, many of the points covered in these standards will not be relevant for administrative surveys designed to collect summary information needed by an agency in administering a specific program (such as summaries of procurement or production status, many types of requirements estimates, or fiscal accounting reports from the States on grant-in-aid programs).

It is recognized that the standards cannot be applied uniformly or precisely in all situations. Special considerations may be involved in surveys of an exploratory, experimental or methodological type; or in pilot or preliminary surveys where the primary purpose is to evaluate alternative approaches or techniques. Similarly, no single survey design can meet all requirements. A particular design should be that most appropriate for a given set of purposes, in relation to considerations of time and cost. Such considerations will help to determine, for example, whether to conduct a survey by mail or by personal interview, whether to use complete enumeration, some systematic sample design or "cut-off" procedure, or some other suitable device for selection of the respondents.

The standards are presented as guides for the planning and conduct of surveys, and not as a requirement of additional materials for Bureau of the Budget review of plans and report forms under the Federal Reports Act. In submitting materials to the Bureau of the Budget for review under the Federal Reports Act and Budget Circular No. A-40, Revised, the agency need supply only the information and attachments already required by Standard Form 83. During the review process, however, the Bureau of

the Budget may in specific instances ask the agency to furnish additional information on its consideration of appropriate standards.

Survey Standards

1. Purpose of the survey

Before any other steps are taken in planning a survey there should be a clear understanding of the precise purposes to be served in terms of information to be collected, hypotheses to be tested, or problems to be solved. It is helpful in reaching such an understanding to prepare a concise statement of the quantitative information needed and the exact purpose to be served.

2. Relation to other surveys or programs

Before the scope and content of a survey are determined, prior work and current activities in the field should be reviewed, and the problem defined in relation to similar programs. Earlier surveys on similar topics should be analyzed, and relationships to existing data fully explored.

3. Development of the survey plan

Decisions should be reached on each of the following points in terms of the purposes to be served, the costs involved, the time required, the degree of precision needed, administrative limitations (established practices, location of field offices, etc.), and need for including or excluding specific areas for nontechnical reasons:

a. Respondents. The respondent group should be defined in terms of the classes, segments or areas to be included in the survey. In selecting the respondent group, attention should be given to the availability and nature of source materials, such as mailing lists, maps, directories.

b. Extent of coverage. Within the respondent group selected, it must be decided whether enumeration should be complete or partial; if partial, whether by means of a probability sample, "cut-off" point, or other plan. Specifications for the sampling plan for partial coverage surveys are described in Section 7.

c. Frequency and timing. It must be determined whether the survey is to be single-time, recurrent, or periodic, and if periodic whether it should be made at monthly, quarterly, annual or other intervals. The timing of a survey should be considered

in relation to what is known about cyclical or other variations over time in the data being studied, so that the survey results may be of maximum use.

d. Method of collection. It must be determined whether the information is to be collected by mail, personal interview, telephone, telegraph, or other method, or by some combination of these methods.

e. Consideration of nonsampling errors. In advance of the final decision on method, an attempt should be made to identify the main sources of bias and of accidental and nonrandom errors anticipated from alternative procedures, and to indicate the difficulties that may arise from inadequate coverage of the respondent group. Plans for testing the reliability of the data and studying errors of response and other nonsampling errors, including interviewer bias, should be incorporated in the basic project plan.

f. Standard definitions and classifications. Wherever applicable, the standard definitions and classifications issued by the Bureau of the Budget should be used in the survey plans, so that the resulting data may be consistent with data from other statistical projects. These standard definitions and classifications include:

Standard Commodity Classification
Standard Industrial Classification
Standard Definitions of Metropolitan Areas
Standard Definitions of Employment and Production Workers
Standard Payroll-reporting Period

g. Processing and interpretation of the data. The basic design of the survey plan should include:

Procedures for editing and coding--methods proposed, codes, records, and provisions for evaluation of coding procedures
Tabulation plans, illustrated by dummy tables and describing method of showing "unknowns" and refusals (e.g., whether distributed or shown separately)
Processing plans--whether manual or mechanical, and provision for controlling the errors of processing
Outline plans for the analysis and interpretation of results

h. Allowance for pretests and follow-ups. Development of the survey plan should include allowance for pretests needed to test the feasibility of the plan, and for follow-ups necessary to increase the rate of response and the accuracy of the survey results. Recommendations for the planning of pretests are presented in Section 5, and for follow-ups in Section 6.

i. Comparison with data from other sources. Plans should be made for comparison of the data obtained in the survey with data from independent sources. Although such comparisons cannot be used as validation of the survey results, they do often afford information that is extremely useful in the interpretation of the results.

j. Proposed calendar. Approximate dates for the following steps in the conduct of the survey should be determined in advance to ensure orderly completion of the project:

Beginning of the preliminary work on the design of the survey
Beginning and completion of the pretest
Beginning of the field work or mailing of questionnaires
Completion of the field work or due date for questionnaires
Completion of the editing and coding
Completion of the tabulations
Completion of the preliminary report
Completion of the final report, including evaluation of the variances and biases of the survey results

k. Cost estimates. Estimates should be made of the anticipated total costs of the survey, including those for:

Preliminary and exploratory work
Development and printing of questionnaires, definitions and instructions
Manuals and other instructions for the conduct of the survey
Collection (mailing costs or field costs, including interviewing, travel, and supervision)
Editing and coding
Tabulation
Analysis and preparation of final report
Overhead and other costs

4. Questionnaire and accompanying instructions

The questionnaire or report form and accompanying instructions should be designed in accordance with the general principles set forth in "Standards for the Design of Report Forms" (Bureau of the Budget, August 1945--to be reissued as one of the Exhibits to Circular No. A-46). This manual, which applies to administrative as well as to statistical forms, includes recommendations relating to specific items on the form and guides on layout and printing.

5. Pretests

It is desirable to test the feasibility of most survey plans in advance. Pretests should be designed and conducted to obtain answers to

a limited number of explicit questions on such topics as:

Relative effectiveness and costs of alternative questionnaires, instructions, and operating procedures
Acceptability and intelligibility of the questions from the respondent's point of view
Possible misunderstandings of questions and procedure on the part of the interviewers
Clarity and applicability of definitions and classifications; reference dates
Completeness of questions for correct coding and interpretation
Defects in the forms, maps, lists, instructions, etc.
Estimates of strata means and variances
Response rates

Without proper statistical design the pretest may fail to give answers to these questions.

The pretest should be kept as simple as possible so that clearcut answers to the questions being tested will not be obscured by administrative complexities. This criterion, with consideration of the specific objectives to be served and the cost and time elements involved, should determine the choice of classes or localities in which the pretest is to be conducted; the approximate size of the pretest (number of interviews); the sampling plan within the classes or localities selected; the maps, lists or directories to be used; the pretest calendar, including date of commencement and date when tabulations are to be made available; the records to be kept; the tabulations required; and the analyses to be made.

The tabulations should be limited to those necessary to answer the specific questions for which the pretest was designed, and should generally not include additional tabulations for research purposes or for preliminary results for which the pretest data may not be valid.

Adequate time should be allowed for the results of the pretest to be analyzed and used to modify the plans for the main survey.

6. Follow-ups

In most surveys response to the first attempt to collect the information, whether by mail or personal enumeration, is insufficient for final estimates, and a procedure of follow-up is needed. In planning the number and timing of follow-ups, consideration should be given to the estimated rate of response to the initial inquiry and to the precision required. The method of collection used in successive follow-ups--whether by mail, call-back interview, or other means--should be determined by the response rates which can be anticipated from alternative methods, considered in relation to the costs involved.

Analysis of successive follow-ups and information on characteristics of those not responding initially is generally needed to aid in preparing final estimates from the survey. Information on characteristics obtained from respondents unable or unwilling to provide the information called for on the questionnaire may be useful in the interpretation of the data.

7. Development of the sampling plan for partial coverage surveys

In partial coverage surveys, the development of the mailing or interview list should be carefully defined and fully described. The first step in developing the list of respondents is to define the type of sample design--i.e., whether a probability sample, a case study of type situations, complete enumeration of some previously developed listing, a "cut-off" (inclusion of all cases beyond a specified criterion, such as size of business, and of no cases below that criterion), or some other plan.

Selection of the particular method of partial coverage depends on the purposes to be served. Probability samples are necessary where unknown biases of selection and estimation will be hazardous and where it is desirable to know the precision of final results. Use of the cut-off point often produces the data needed at minimum cost and burden. Surveys using cut-off points will be most efficient if designed with the aid of a cost-function and the theory of probability to achieve a minimum mean square error. Reasons for selection of a particular method of partial coverage should be included in the description of the sampling plan.

Once the method of partial coverage has been defined, a description of the sample design should be prepared, the universe defined, along with the "frame" or list of units from which the sample may be selected, the basis for grouping these units, the technique of selecting particular units in each group for inclusion in the sample, and the methods for summarizing information collected from those units and drawing inferences about what has been revealed by the survey.

The description of the sample design might be checked against the outline below. The outline is directly applicable to probability samples, but many of the items are relevant to other designs as well. The terminology used in the outline is consistent with that defined in "The Preparation of Sampling Survey Reports" (United Nations Statistical Papers, Series C, No. 1 (Revised), 15 February 1950).

a. Sampling units

The primary units (description and number in universe)
The sampling units to be used at the second and higher stages (description and number in universe)

b. Lists, maps, directories and other aids that will define and delineate the sampling units. Construction of lists in the field.

c. Criteria of stratification

d. The cost function

e. The formula for the variance

f. The optimum allocation of the sample

g. Method of drawing the sample at each stage, including the ratio sampled, by stratum and by stage, and the technique of identifying the individual sample respondents (e.g., by use of random numbers, or by systematic selection from a random start)

h. Form of estimate proposed, for each variate of major importance--

Formula for the estimate; source of benchmark data if employed; weights, derivation
Universe parameters (proportions, variances, correlations, and their effect on the sample design)
Numerical evaluation of any bias in the formula of estimation
Formula for the expected variance
Numerical approximation to the variance

i. Statement regarding the proposed control and measurement of biases--

Methods proposed for reducing nonresponse
Revisits to measure failures and defects arising from under-coverage and over-coverage; misunderstanding the questionnaire and instructions; interviewers' biases; incorrect definition and classification; various kinds of errors of reporting

8. Supervision of field enumeration

In large-scale statistical surveys made by personal enumeration, it is particularly important to develop well organized procedures to aid in achieving good performance and maximum consistency. In establishing procedures for the conduct and supervision of field work, consideration should be given to:

a. Methods of selection, training and supervision of the enumerators.

b. Specifications for training field workers, including number of hours of training, methods and devices used for training purposes, whether payment is made for training sessions.

c. Organization for the supervision of the field work, including qualifications and experience of the supervisors, method and frequency of communication between central and field offices.

d. Basis of payment to enumerators (piece-work, hourly, full-time, etc.) and scale of wages and salary.

e. Plans for measuring differences among enumerators.

f. Plans for measuring major types of biases, including those arising from the enumerators, the questionnaire design, timing, and respondents.

g. Anticipated rate of response; differential rate by type of respondent.

h. Specification of what method or methods will be used to deal with nonresponse--the number of call-backs required and the procedure for making them; the method of correcting for varying probabilities of individuals being at home; subsampling of nonrespondents; or other techniques for dealing with nonresponse.

i. Provision for central control in large field studies, and establishment of procedures to insure uniform and consistent rulings on matters not covered by instructions.

9. Manuals and other instructions for the conduct of the survey

Instructions should be developed for all phases of the survey to explain the basic definitions and set forth in detail the procedures to be followed. Depending on the magnitude and type of survey, materials which should be prepared include:

Specifications for selection and training of enumerators, field supervisors, editors, coders, analysts, etc.
Manual of instructions for field workers, including procedures for listing and for selecting the sample, training kits, etc.
Manuals of instructions for editors, coders, machine operators, etc.

10. Progress and cost reporting

In large-scale statistical surveys, there should be systematic plans for reporting progress on each phase of the survey, to determine

whether the allowances of time and funds are being met and make possible any necessary modifications in the survey calendar. These reports should also call attention to particular problems encountered, to aid in evaluating final results and in planning other surveys. Items which should be included in the periodic reports are:

Progress of the work, in the field and in the office
Description of any special difficulties or costs encountered in the field; proposed remedies
Description of any special difficulties encountered in the office; proposed remedies
Description of difficulties encountered with the definitions
Identification of any special biases encountered (nonresponse, failure to understand the questions, failure of the interviewers to understand the definitions and sampling procedures, etc.)

At the conclusion of every survey a cost analysis should be made, covering the items listed in Section 4, paragraph k. The final costs should be compared with the advance estimates and summarized for future use.

11. Preparation and publication of the final report

Good statistical practice for the conduct of a survey includes, finally, a careful presentation of the results. Attention should be given in preparing the final report on the survey to the "Standards for the Publication of Statistical Data." These standards, issued in 1947, were developed by the Bureau of the Budget in cooperation with the major statistical agencies of the Government to reduce the areas of possible misunderstanding or misinterpretation of statistical data. They will be reissued as one of the Exhibits to Circular No. A-46.